

Remarks

Reconsideration of the application is requested.

Claims 1, 5, 6, and 8 remain in the application. Claim 1 has been amended.

In the second item on page 2 of the above-identified final Office Action, claims 1 and 8 have been rejected as being unpatentable over Yamada et al. (U.S. Patent 4,986,215) (hereinafter "Yamada") under 35 U.S.C. § 103(a). The Examiner states that the rejection is maintained as stated in the previous Office Action of December 17, 2002 and further in view of the statements on pages 2 and 3 of the above-identified final Office Action.

The rejection has been noted and claim 1 has been amended in an effort to even more clearly define the invention of the instant application. Support for the changes is found on page 3, lines 13-17, page 4, lines 14-16, and page 7, line 14 to page 8, line 4 of the specification of the instant application.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claim 1 calls for, *inter alia*, a susceptor for supporting a semiconductor wafer having a diameter of **at least 300mm** and a perimeter edge, the susceptor comprising:

a surface for supporting the semiconductor wafer, said surface having a **concave shaped surface area**, said surface area being configured to cause the semiconductor wafer to contact said surface area at the perimeter edge only, said surface having a center portion and an outer portion surrounding said center portion, defining a distance between said center portion and a plane defined by a circle along said outer portion, said circle having a diameter of substantially 300mm and said distance being greater than 500 μ m. (emphasis added)

Yamada discloses a susceptor 1 for supporting a substrate 7. The susceptor has a circular edge or ridge 6, which defines an inner space 4 having a concave bottom. The substrate is supported in line contact with the ridge 6. The ridge 6 supports the substrate at an area inwardly displaced from the perimeter of the substrate. See Fig 3A. The reference discloses that the substrate may have a diameter of 150mm and that the distance (depth "a") between the center portion of the concave surface and the bottom surface of substrate 7 is in the range of 25 μ m to 150 μ m. These dimensions of Yamada are important to obtain the advantages disclosed in Yamada's

specification and as such would require more than "routine optimization" to change them to meet the claim limitations. Yamada does not disclose dimensions for the susceptor per se or the distance between the center portion of the concave susceptor surface and the outer portion of the concave surface as recited in claim 1 of the instant application. The claimed dimensions enable the present invention to achieve the advantages disclosed in the instant specification.

The Examiner does not distinguish between the perimeter edge of the wafer of the present invention which contacts the concave surface area of the susceptor and the area of the perimeter edge of the wafer 7 of Yamada, which contacts the ridge 6 of the susceptor 1. Claim 1 has been amended to clearly emphasize this difference between the present invention and Yamada. Claim 1 recites that the surface of the wafer susceptor has a concave shaped surface area which is configured to cause the semiconductor wafer to contact the perimeter edge only. Thus, the concave shaped surface area per se of the susceptor surface only contacts the perimeter edge of the wafer according to the present invention.

To the contrary, in Yamada the ridge 6 contacts the wafer, not a concave shaped surface area of the wafer. The ridge itself does not have a concave shape and therefore, the ridge must contact the wafer within a specific range disclosed in Yamada

as from 0.6R to 0.9R (see col. 4, lines 3-4). Thus, it is apparent that one skilled in the art would not necessarily construct the susceptor of Yamada with a ridge that contacts the wafer only at its perimeter edge, namely at a radius of 1.0. According to the present claimed invention, the wafer is contacted at its perimeter or boundary edge, that is 1.0R. In view of the foregoing it is submitted that it would not be obvious to modify Yamada to arrive at the claimed invention.

The Examiner argues that modification of Yamada to arrive at the claimed invention involves "design choice" and "routine experimentation and optimization to choose [these] particular dimensions." Applicant respectfully disagrees with the Examiner's statements. The examples disclosed in Yamada are based on a 150mm wafer. The depth "a" is in the range of from 25 μ m to 150 μ m. There is no suggestion or teaching that such depth can be changed or how it would be changed for a 300mm wafer as recited in the claims. There is no disclosure as to how one would scale up the dimensions for a 300mm wafer. For example, if the device was scaled up proportionately then the scale-up factor would be a factor of two (2 x 150mm). Thus, the depth "a" for a 300mm wafer would be in the range of from 50 μ m to 300 μ m. However, according to the present invention the depth between the wafer and the center portion of the

concave shaped susceptor is "greater than 500 μ m" as recited in claim 1 of the instant application.

Therefore, it is apparent that Yamada does not disclose the specific dimensions recited in claim 1 nor would it be obvious for one skilled in the art to arrive at such dimensions through "routine optimization," as the Examiner alleges. Yamada teaches away from providing the specific dimensions recited in claim 1 as discussed above. Contrary to the Examiner's statements, the claimed dimensions are important features of the present invention to achieve the desired objectives and advantages described in the instant specification. For example, it is important that the claimed wafer have a dimension of at least 300mm, not 150mm as disclosed in Yamada, in order to support only the perimeter (or boundary) edge of the wafer. This avoids movement of the wafer, particularly when the susceptor is hot. Contrary to the Examiner's assertions, applicant submits that the claimed dimensions and spacing are important to obtaining the advantages of the present invention and are beyond "routine optimization", and therefore should be afforded patentable weight.

Clearly, Yamada does not disclose a susceptor for supporting a "semiconductor wafer having a diameter of at least 300mm and a

perimeter edge" in which the susceptor has "a surface for supporting the semiconductor wafer, said surface having a concave shaped surface area, said surface area being configured to cause the semiconductor wafer to contact said surface at the perimeter edge only, said surface having a center portion and an outer portion surrounding said center portion, defining a distance between said center portion and a plane defined by a circle along said outer portion, said circle having a diameter of substantially 300mm and said distance being greater than 500 μ m", as recited in claim 1 of the instant application.

In the first item on page 3 of the above-identified Office Action, claim 5 has been rejected as being unpatentable over Yamada as applied in the rejection of claims 1 and 8, and further in view of Martin et al. (U.S. Patent 4,579,080) (hereinafter "Martin") under 35 U.S.C. § 103(a). The Examiner states that Martin is applied as stated in the prior Office Action dated December 17, 2002.

The arguments presented above relative to Yamada are applicable in the rejection of claim 5, which depends from claim 1.

While Martin discloses that a susceptor 52 may be formed of graphite or another material such as molybdenum, the reference does not overcome the basic deficiencies of the primary Yamada reference. Therefore, claim 5, which depends from claim 1, is believed patentable for the same reasons as discussed relative to claim 1.

In the second item on page 3 of the above-identified Office Action, claim 6 has been rejected as being unpatentable over Yamada as applied in the rejection of claims 1 and 8, and further in view of Wolf, Vol. 1, under 35 U.S.C. § 103(a).

Claim 6 depends from claim 1 and is believed patentable for the same reasons as discussed above.

Applicant disagrees that he did not "properly contest the taking of official notice" and has not admitted and does not admit that the subject matter of the official notice was admitted as prior art.

In view of applicant's foregoing statement regarding claim 6 and the Examiner's citation of Wolf, the issue of official notice is deemed moot.

Moreover, applicant respectfully disagrees with the Examiner's dismissal and disregard of specific claimed features such as the claimed dimensions and spacing recited in claim 1 of the instant application. The prior art does not disclose or suggest providing specific dimensions and spacing of a semiconductor wafer and a susceptor for supporting the semiconductor wafer, namely, a "semiconductor wafer having a diameter of at least 300mm" and "a distance being defined between said center portion and a plane defined by a circle along said outer portion, said circle having a diameter of substantially 300mm and said distance being greater than 500 μ m", as recited in the claim 1. More than routine skill and optimization and design choice are required to provide the dimensional relationships of the claimed invention in order to achieve the desired advantages and benefits of the instant invention. The specific dimensions of the distance between the wafer and the center portion of the concave surface and that the surface of the susceptor is close enough to the backside of the wafer, which allows efficient heating to occur, are important features that enable the present claimed invention to obtain its desired advantages. The prior art does not teach or suggest such specific features. One skilled in the art could conceivably select any number of dimensions from an infinite multiplicity of possibilities and still would not necessarily select those recited in the claims of the instant application without the benefit of hindsight.

Applying the Examiner's reasoning is tantamount to saying that that no patentable weight should be given to claimed dimensions of claimed specific structural elements. Such is not the case and the Examiner's statements are not considered a proper basis for rejecting these claimed features.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 1.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out. In the alternative, the entry of the amendment is requested, as it is believed to place the application in better condition for appeal, without requiring extension of the field of search.

If an extension of time for this paper is required, petition for extension is herewith made.

Please charge any other fees that might be due with respect to
Sections 1.16 and 1.17 to the Deposit Account of Lerner and
Greenberg, P.A., No. 12-1099.

Respectfully submitted,


For Applicant

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